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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/772,188

Applicant(s)

GRALENSKI, NICHOLAS

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 2 contains the trademark/trade name "Kanthal". Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a type of resistive wire and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,649,261 to Sheets.

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6. Sheets discloses a furnace capable of atmospheric chemical vapor deposition for depositing thin films on a workpiece at a temperature of 1200°C and above (column 5, rows 3-15 and column 17, rows 15-25), comprising: a process chamber (Figures 1-3, 10) comprising a reflective interior surface (column 9, rows 16-22) for containing and reflecting heat back to heating elements, including means for actively cooling the process chamber surface (column 21, rows 15-26); and plurality of linear heating elements (17) disposed in one or more planar arrays within the process chamber and in proximity to the workpiece such that the temperature difference between the workpiece and heating elements is minimized and the heating elements, with the reflective heat containment of the process chamber, approximate an isothermal chamber (column 13, rows 35-48).

7. Examiner notes that Applicant's claims include numerous recitations drawn to an intended method that could be used with the apparatus. It is therefore also noted that the courts have ruled that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). The courts have also ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,477,718 to Crain et al. in view of U.S. Patent No. 3,836,751 to Anderson and U.S. Patent No. 5,329,097 to Jones et al.

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10. Crain et al discloses an atmospheric pressure furnace substantially as claimed and comprising: a process chamber having surfaces (boundaries of processing space) defining an entrance, an exit and a processing region for processing a workpiece; rails (Figure 2, 19) provided on opposed interior surfaces of the chamber, said rails positioned for supporting a workpiece along an axis of travel from the entrance, through the processing region, and to the exit of the process chamber; a first array of parallel, closely-spaced elongated heating elements positioned below the rails (Figure 2, 50;); a second array of parallel, closely-spaced, elongated heating elements disposed above the rails (Figure 2, 50); wherein said first and second arrays of heating elements comprises resistive wires protected by ceramic tubing (column 4, rows 9-12) and the ends of the heating elements extend through apertures in the process chamber and are held in an external mounting structure for connection to an electric current (column 4, rows 12-24); and cooling channels (74) disposed in the exterior surface of the process chamber (column 4, rows 66-68). The resistive wires extend longitudinally through the ceramic tubing such that the wires are free to expand and contract in response to temperature changes (column 4, rows 10-12).

11.

12. However, Crain et al. fail to teach the process chamber having highly polished interior surfaces.

13. Anderson teaches the use of polished aluminum surfaces in a workpiece heating apparatus for the purpose of reflecting and directing heat from heating elements (column 3, rows 4-12).

14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the walls of Crain et al. as polished aluminum walls in order to reflect and direct heat from heating elements as taught by Anderson.

15. Crain et al. further fail to explicitly teach the rails are made of aluminum, Anderson teaches that aluminum can be used as a construction material in a furnace for reflecting and directing heat from heating elements, as described above.

16. It would have been obvious to one of ordinary skill in the art that because the rails are also a structure located in the furnace and in contact with the heating sources by providing them made of metal,

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they too could be made to reflect and direct heat from heating elements as needed as taught by Anderson.

17. Crain et al. and Anderson disclose the invention substantially as claimed and as described above.

18. However, Crain et al. and Anderson fail to teach the ceramic tubing as alumina and the resistive wires as "Kanthal" (i.e. an alloy of mainly iron, chromium, and aluminum).

19. Jones et al. teach the use of a heater having a resistive wire comprising an alloy of mainly iron, chromium and aluminum surrounded by alumina material for the purpose of choosing design materials capable of operation at high temperatures and in oxygen (column 4, rows 55 through 5, row 54 and column 8, rows 35-61).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a heater having a resistive wire comprising an alloy of mainly iron, chromium and aluminum surrounded by alumina material in Crain et al. and Anderson in order to choose design materials capable of operation at high temperatures and in oxygen as taught by Jones et al.

21. Claims 3-4, 6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,477,718 to Crain et al. in view of U.S. Patent No. 3,836,751 to Anderson.

22. Crain et al discloses an atmospheric pressure furnace substantially as claimed and comprising: a process chamber having surfaces (boundaries of processing space) defining an entrance, an exit and a processing region for processing a workpiece; rails (Figure 2, 19) provided on opposed interior surfaces of the chamber, said rails positioned for supporting a workpiece along an axis of travel from the entrance, through the processing region, and to the exit of the process chamber; a first array of parallel, closely-spaced elongated heating elements positioned below the rails (Figure 2, 50;); a second array of parallel, closely-spaced, elongated heating elements disposed above the rails (Figure 2, 50); wherein said first and second arrays of heating elements comprises resistive wires protected by ceramic tubing (column 4, rows 9-12) and the ends of the heating elements extend through apertures in the process chamber and are held in an external mounting structure for connection to an electric current (column 4, rows 12-24);

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and cooling channels (74) disposed in the exterior surface of the process chamber (column 4, rows 66-68).

23. However, Crain et al. fail to teach the process chamber having highly polished interior surfaces.

24. Anderson teaches the use of polished aluminum surfaces in a workpiece heating apparatus for the purpose of reflecting and directing heat from heating elements (column 3, rows 4-12).

25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the walls of Crain et al. as polished aluminum walls in order to reflect and direct heat from heating elements as taught by Anderson.

26. With respect to claim 4, the highly polished surfaces disclosed in Anderson are aluminum for reflecting back to the processing region (column 3, rows 4-12).

27. With respect to claim 6, although Crain et al. do not explicitly teach the rails are made of aluminum, Anderson teaches that aluminum can be used as a construction material in a furnace for reflecting and directing heat from heating elements, as described above.

28. It would have been obvious to one of ordinary skill in the art that because the rails are also a structure located in the furnace and in contact with the heating sources by providing them made of metal, they too could be made to reflect and direct heat from heating elements as needed as taught by Anderson.

29. With respect to 8, the resistive wires extend longitudinally through the ceramic tubing such that the wires are free to expand and contract in response to temperature changes (column 4, rows 10-12).

30. With respect to claim 9, Crain et al. disclose that each heating element is modular unit adapted for individual replacement without removing other elements (column 4, rows 59-62; also see USP 4,517,448 – column 8, rows 18-21, also issued to Crain et al. and incorporated by reference into the '718 patent).

31. With respect to claim 10, the electric terminal is made via threaded terminals incorporating short transverse rods (194) that conformably engage recesses in a mounting structure (184). See USP

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4,517,448 – column 5, rows 51-58; column 5, rows 67 through column 6, row 3; and column 6, rows 33-41), also issued to Crain et al. and incorporated by reference into the '718 patent).

32. With respect to claim 11, Crain et al. further comprises gas purge structures at the entrance (32, column 41-47) and exit (column 5, row 63 through column 6, row 2) of the process chamber to prevent air from entering the process chamber while allowing the workpiece to pass through.

33. With respect to claims 12 and 13, a thermal controller (voltage control circuit) is provided for maintaining the desired temperature (column 4, rows 20-24). A specific temperature to be maintained or transitioned to/from would depend on a particular processing method to be used in the apparatus. The courts have ruled that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). The courts have also ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

34. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable Crain et al. and Anderson as applied to claims 3-4, 6 and 8-13 above and further in view of U.S. Patent No. 5,792,273 to Ries et al.

35. Crain et al. and Anderson disclose the invention substantially as claimed and as described above.

36. However, Crain et al. and Anderson fail to teach the polished surfaces are plated with gold.

37. Ries et al. teach providing reflective aluminum surfaces with a gold plating for the purpose of improving reflectivity which reduces their temperature and directs energy toward the chamber and directs thermal energy toward the reaction space (column 4, rows 6-12).

38. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the aluminum surfaces of Crain et al. and Anderson with a gold plating in order to improve reflectivity which would reduce their temperature and also direct thermal energy toward the reaction space as taught by Ries et al.

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39. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable Crain et al. and Anderson as applied to claims 3-4, 6 and 8-13 above and further in view of U.S. Patent No. 6,303,906 to Yoo.

40. Crain et al. and Anderson disclose the invention substantially as claimed and as described above.

41. However, Crain et al. and Anderson fail to teach the rails are molybdenum.

42. Yoo teaches the use of molybdenum as a construction material for a processing apparatus based on its high melting temperature and ability reflect radiant energy (column 7, rows 35-45).

43. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided molybdenum as a construction material in Crain et al. and Anderson in order to take advantage of the materials high melting temperature and ability to reflect radiant energy as taught by Yoo.

44. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,101,759 to Anthony et al. in view of U.S. Patent No. 3,836,751 to Anderson.

45. Anthony et al. disclose a furnace substantially as claimed and comprising: a process chamber (Figures 1-3, 10) comprising a reflective wall (70, column 5, rows 55-65); one or more heating elements (17) provided inside the chamber in direct proximity to a workpiece (30), the end of the heating elements extending through apertures in chamber walls for receiving an electric current (column 5, row 20-54).

46. However, Anthony et al. fail to teach the processing chamber comprising polished aluminum walls.

47. Anderson teaches the use of polished aluminum surfaces in a workpiece heating apparatus for the purpose of reflecting and directing heat from heating elements (column 3, rows 4-12).

48. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the walls of Anthony et al. as polished aluminum walls in order to reflect and direct heat from heating elements as taught by Anderson.

49. With respect to claim 15, Anthony et al. further disclose cooling channels conformably disposed in the exterior surface of the walls for removing non-reflected heat (80 and 120).

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50. Examiner notes that Applicant's claims include numerous recitations drawn to an intended method that could be used with the apparatus. It is therefore also noted that the courts have ruled that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). The courts have also ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore
Patent Examiner
Art Unit 1763
6 February 2006